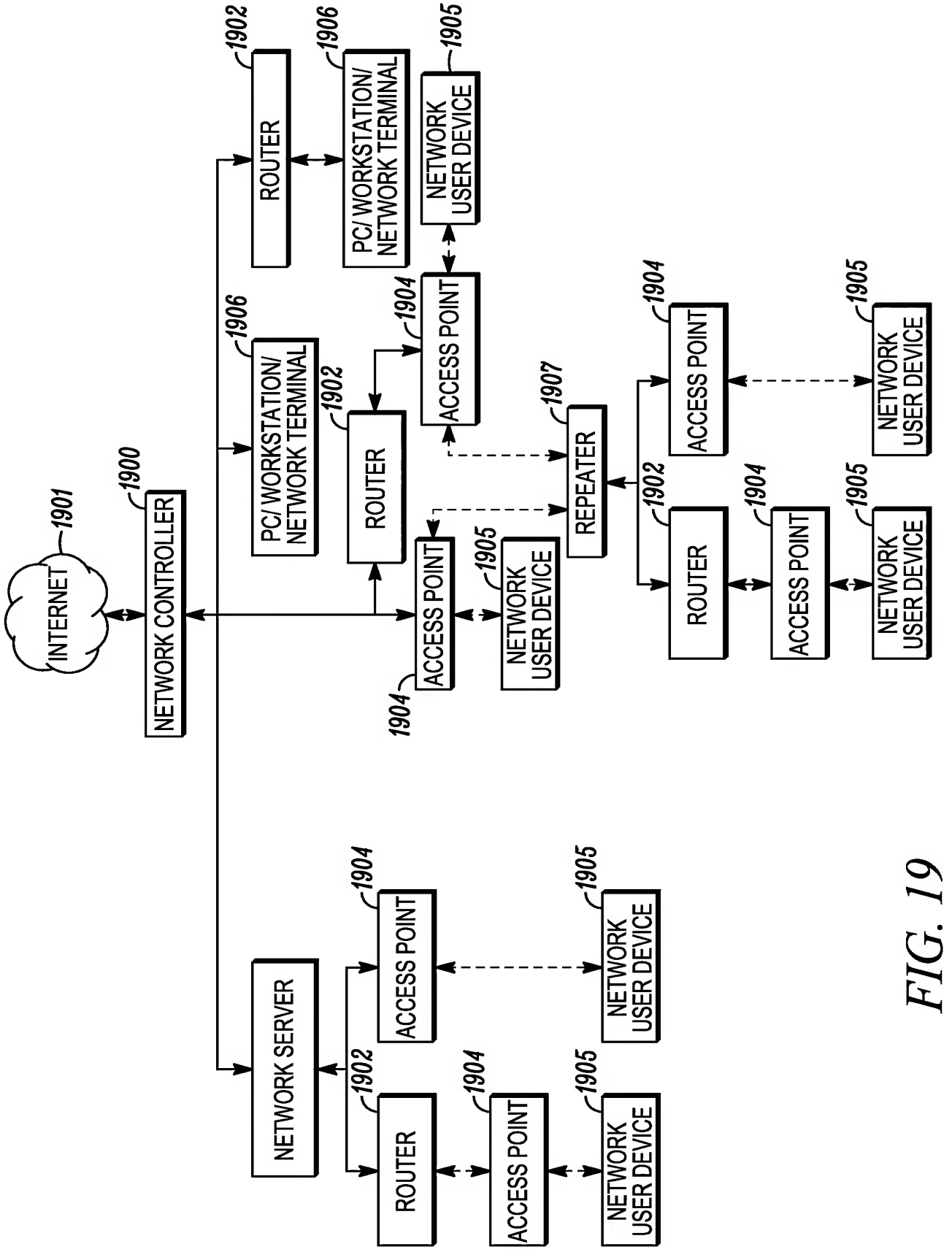
INTERNET
1901
NETWORK CONTROLLER
1900
NETWORK SERVER
ROUTER
1902
PC/ WORKSTATION/
NETWORK TERMINAL
1906
NETWORK
USER DEVICE
1905
ACCESS POINT
1904
REPEATER
1907

FIG. 19

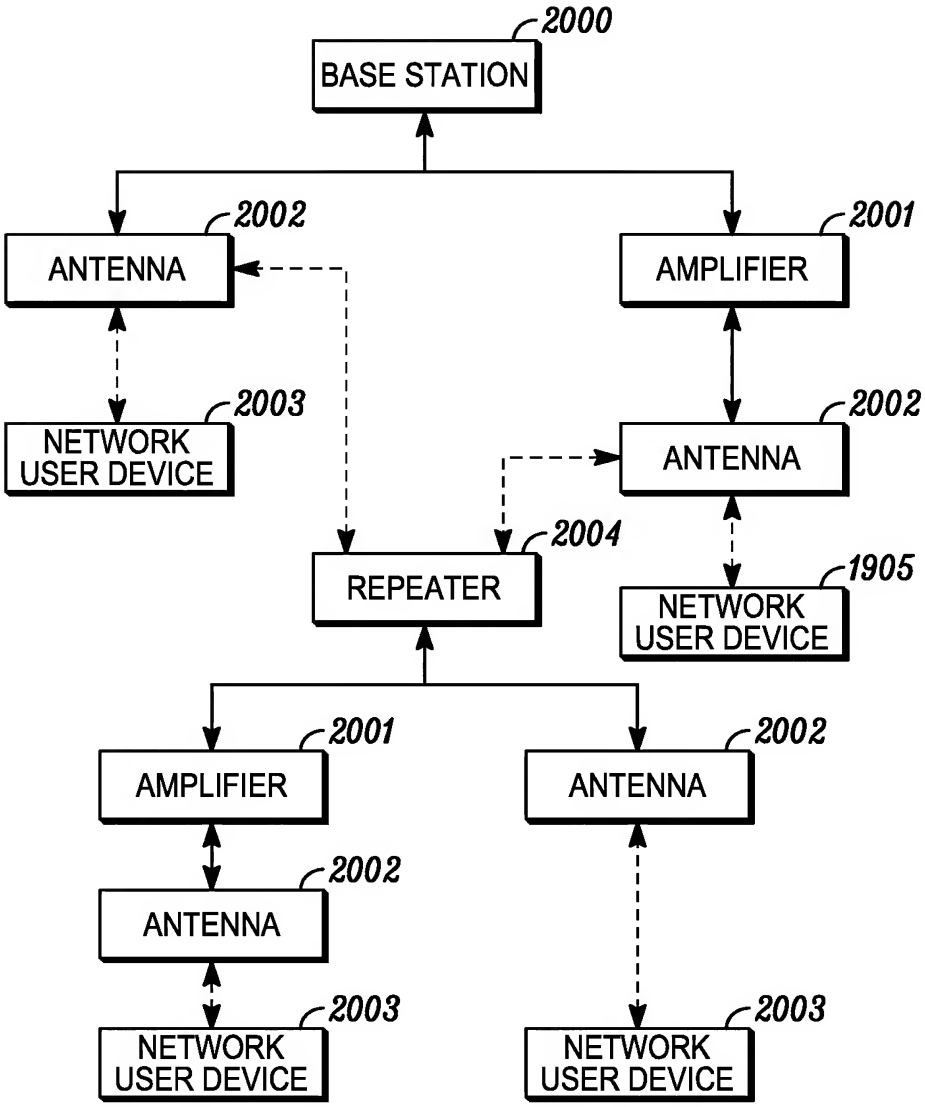
2000
BASE STATION
2002
ANTENNA
2001
AMPLIFIER
2003
NETWORK USER DEVICE
2002
ANTENNA
2004
REPEATER
1905
NETWORK USER DEVICE
2001
AMPLIFIER
2002
ANTENNA
2002
ANTENNA
2003
NETWORK USER DEVICE
2003
NETWORK USER DEVICE

FIG. 20

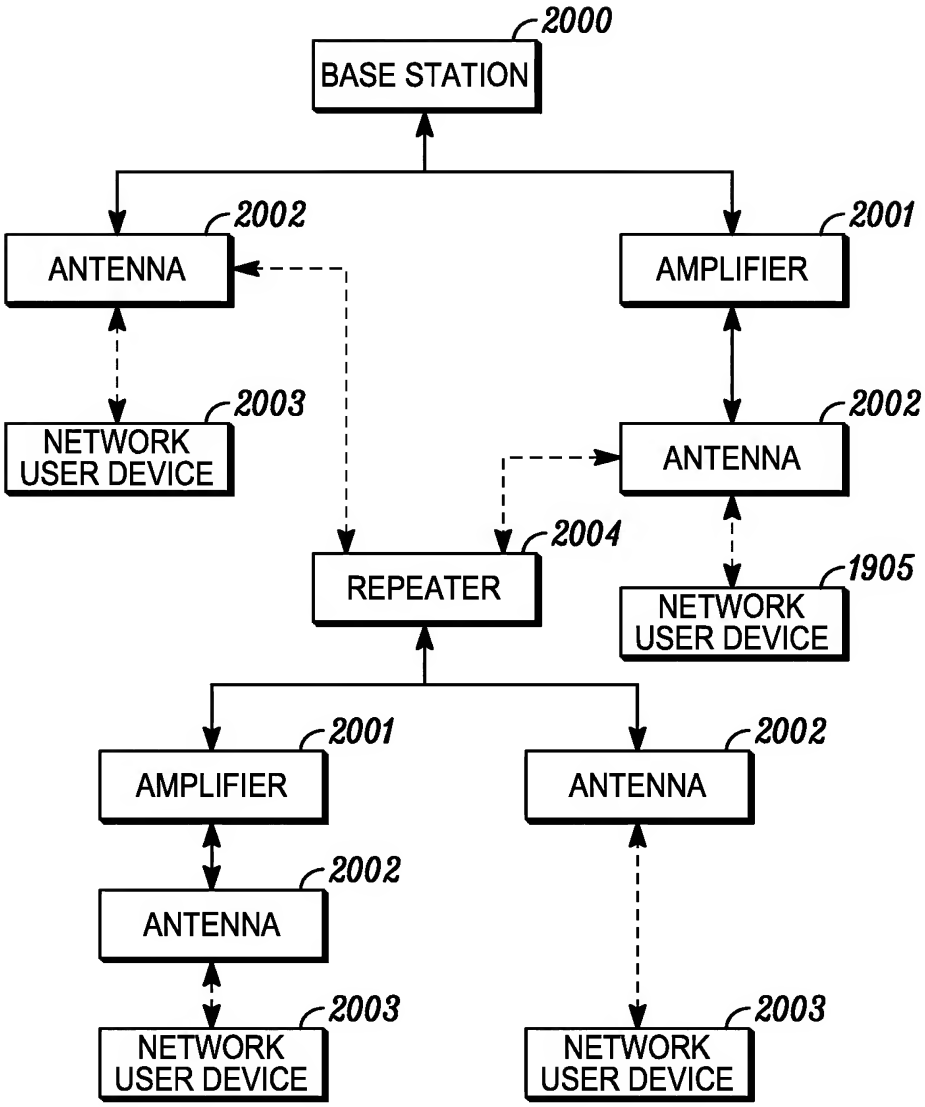
2000
BASE STATION
2002
ANTENNA
2001
AMPLIFIER
2003
NETWORK USER DEVICE
2002
ANTENNA
2004
REPEATER
1905
NETWORK USER DEVICE
2001
AMPLIFIER
2002
ANTENNA
2002
ANTENNA
2003
NETWORK USER DEVICE
2003
NETWORK USER DEVICE

FIG. 20

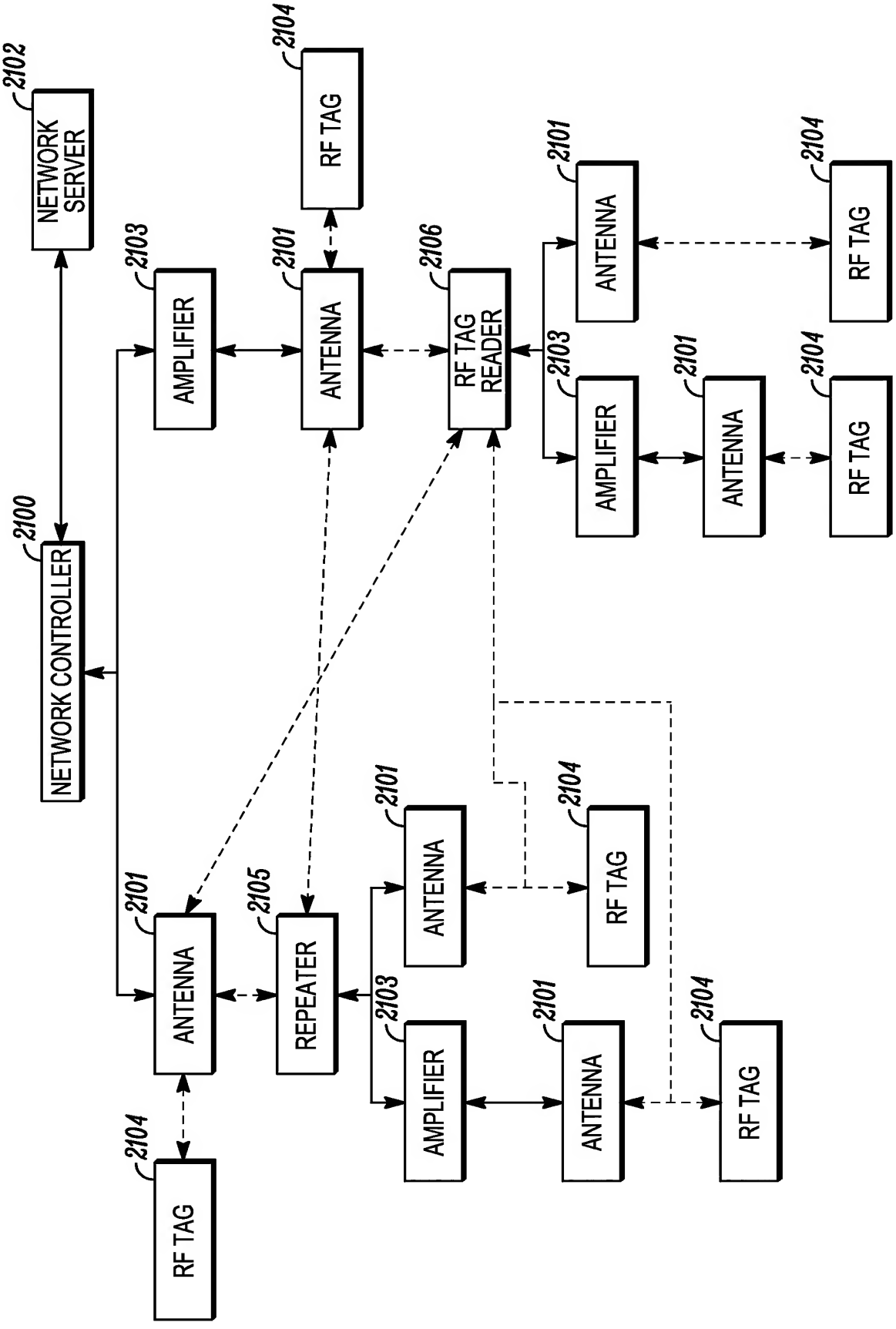
2102
NETWORK SERVER
2104
RF TAG
2103
AMPLIFIER
2101
ANTENNA
2106
RF TAG READER
2101
ANTENNA
2104
RF TAG
2100
NETWORK CONTROLLER
2103
AMPLIFIER
2101
ANTENNA
2104
RF TAG
2101
ANTENNA
2105
REPEATER
2101
ANTENNA
2104
RF TAG
2103
AMPLIFIER
2101
ANTENNA
2104
RF TAG
2104
RF TAG

FIG. 21

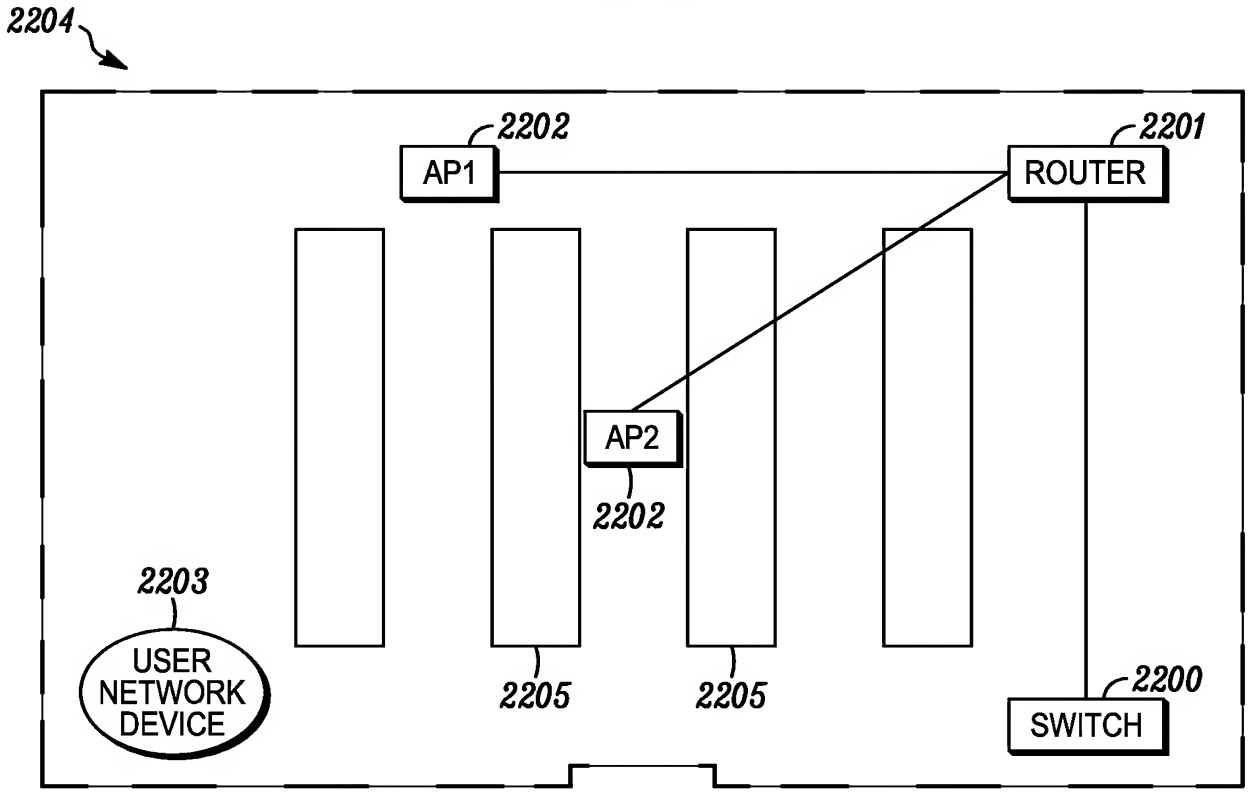

FIG. 22

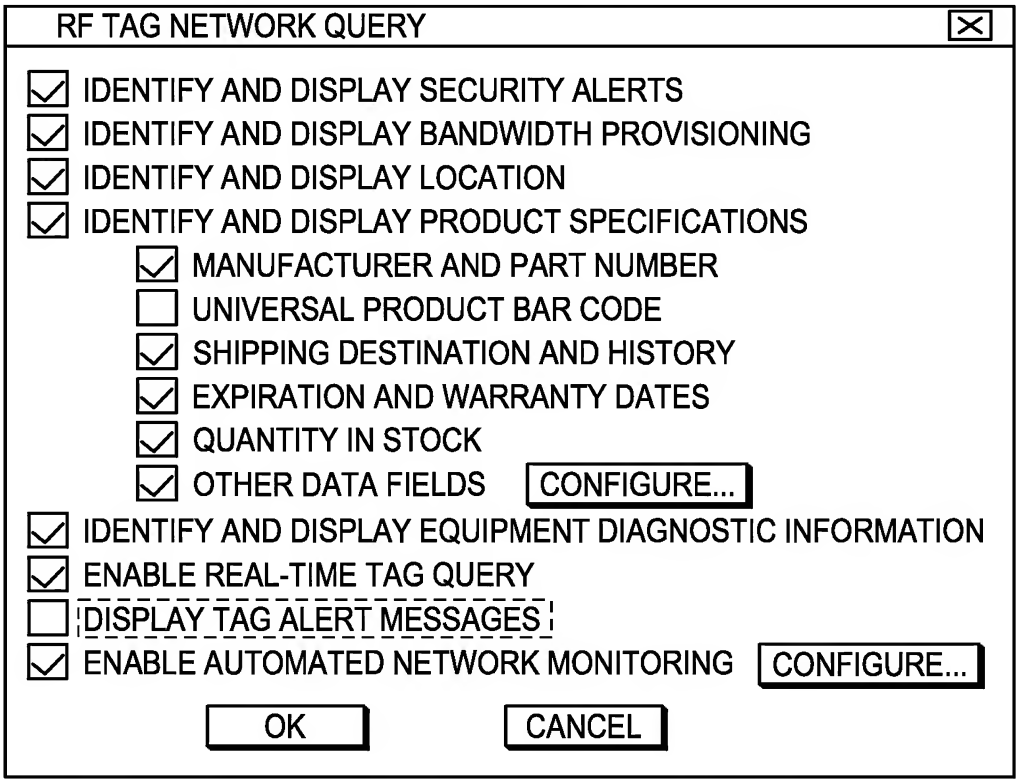

FIG. 23A

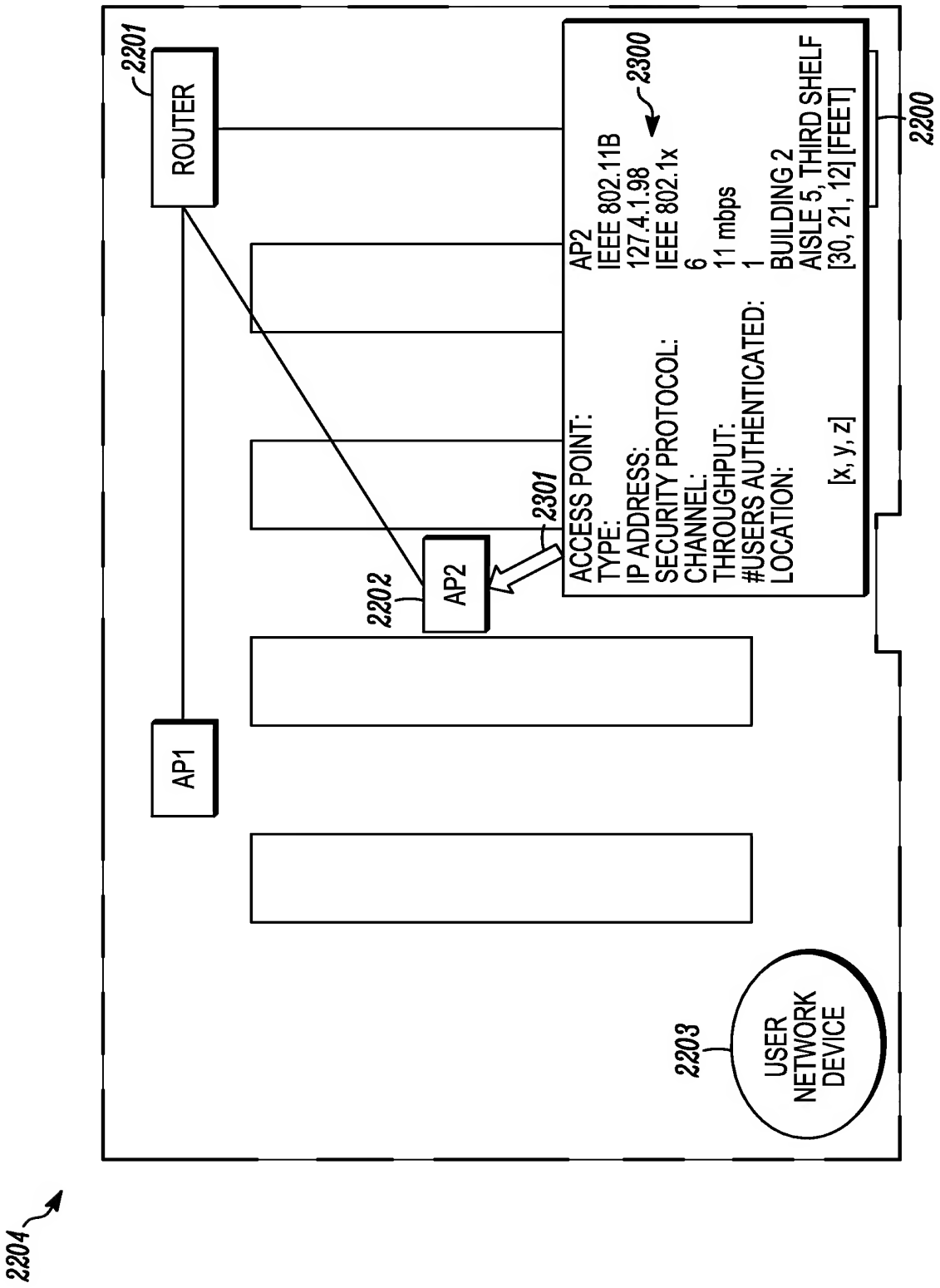
2204
2201
ROUTER
AP1
2202
AP2
2301
2300
ACCESS POINT: AP2
TYPE: IEEE 802.11B
IP ADDRESS: 127.4.1.98
SECURITY PROTOCOL: IEEE 802.1x
CHANNEL: 6
THROUGHPUT: 11 mbps
#USERS AUTHENTICATED: 1
LOCATION: BUILDING 2
AISLE 5, THIRD SHELF
[x, y, z] [30, 21, 12] [FEET]
2200
2203
USER NETWORK DEVICE

FIG. 23B

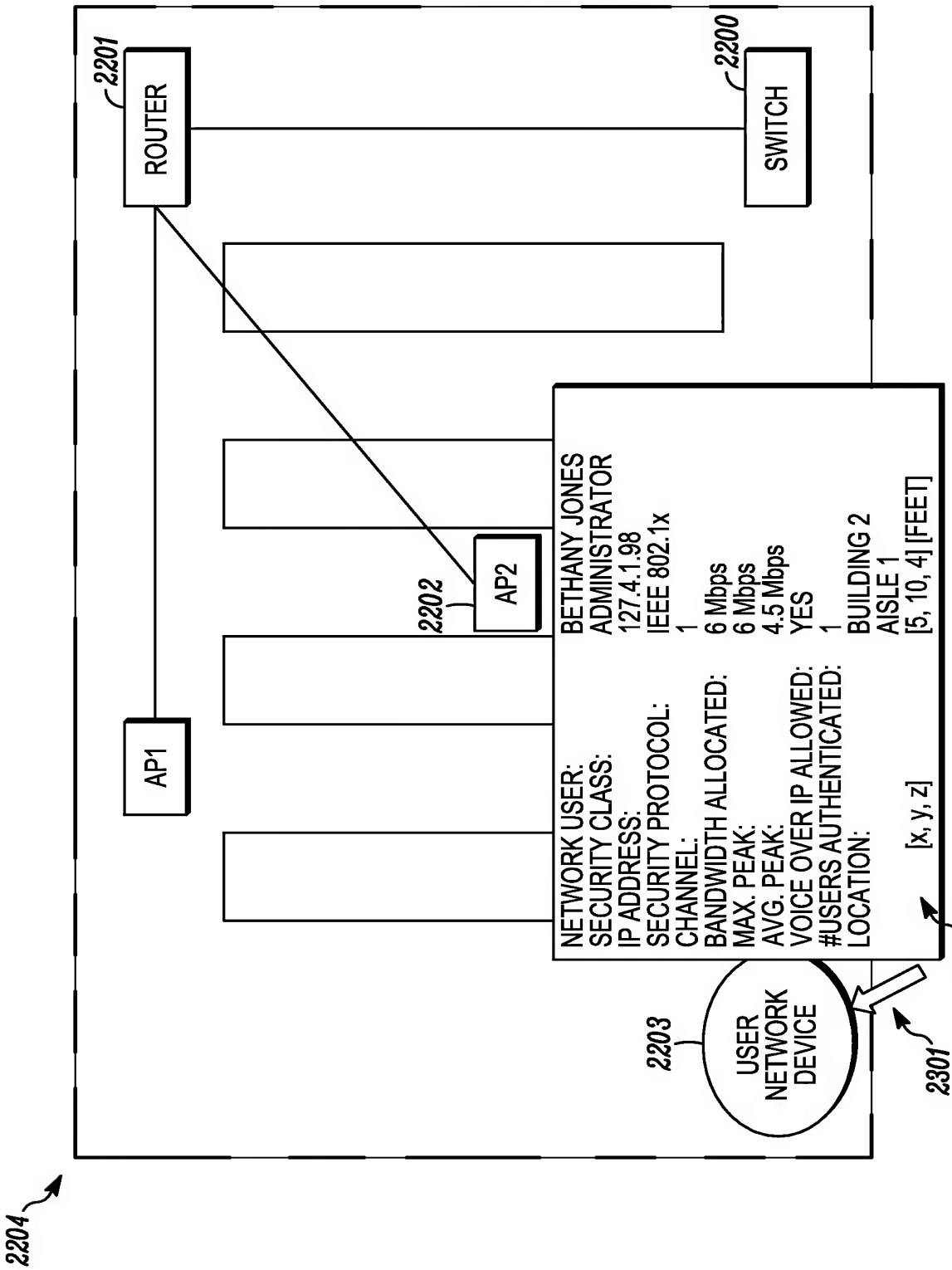
2204
2201
ROUTER
2200
SWITCH
AP1
2202
AP2
NETWORK USER: BETHANY JONES
SECURITY CLASS: ADMINISTRATOR
IP ADDRESS: 127.4.1.98
SECURITY PROTOCOL: IEEE 802.1x
CHANNEL: 1
BANDWIDTH ALLOCATED: 6 Mbps
MAX. PEAK: 6 Mbps
AVG. PEAK: 4.5 Mbps
VOICE OVER IP ALLOWED: YES
#USERS AUTHENTICATED: 1
LOCATION: BUILDING 2
AISLE 1
[x, y, z] [5, 10, 4] [FEET]
2300
2203
USER NETWORK DEVICE
2301

FIG. 23C

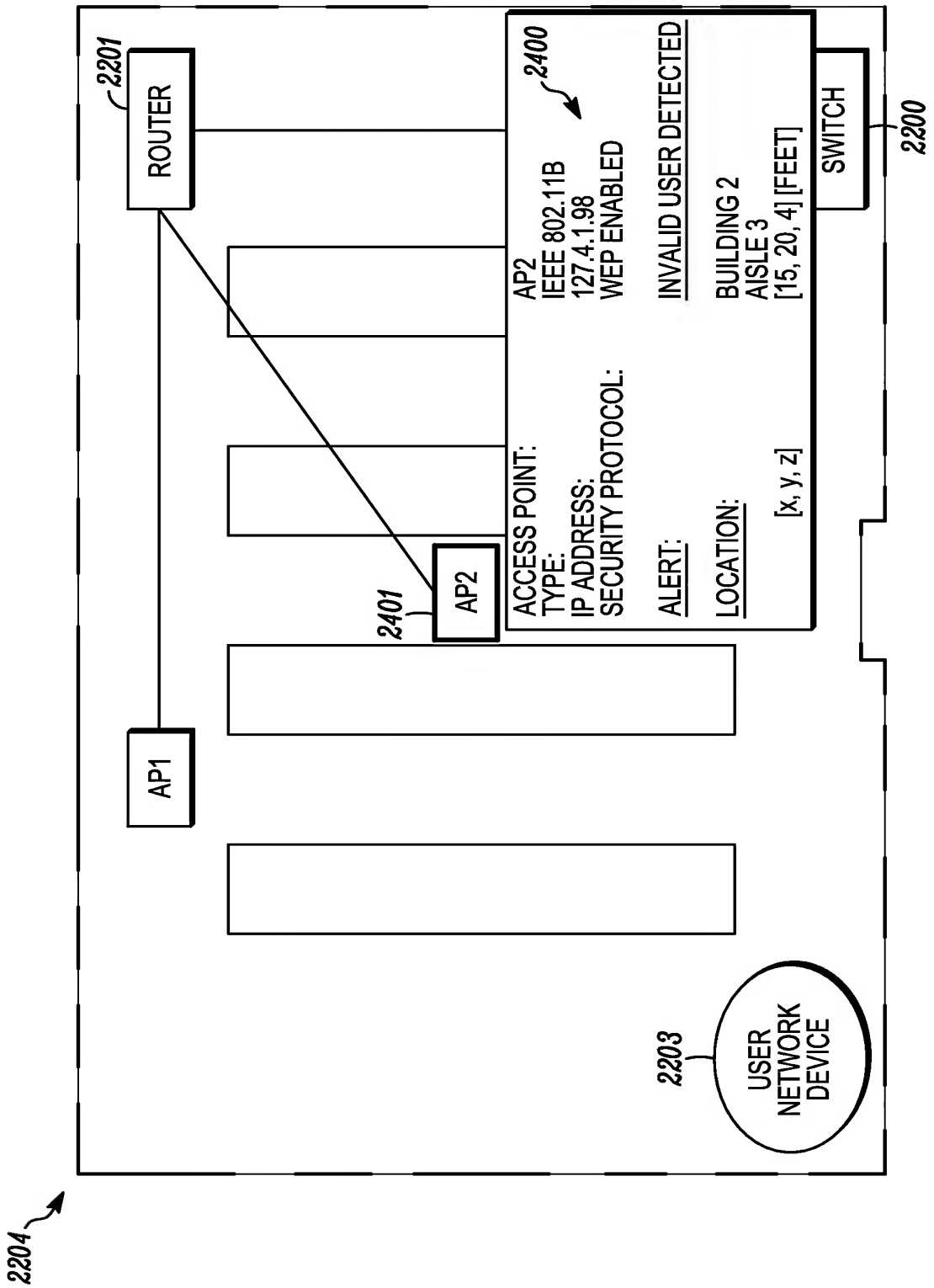
2204
2201
ROUTER
AP1
2401
AP2
2400
ACCESS POINT: AP2
TYPE: IEEE 802.11B
IP ADDRESS: 127.4.1.98
SECURITY PROTOCOL: WEP ENABLED
ALERT: INVALID USER DETECTED
LOCATION: BUILDING 2
AISLE 3
[x, y, z] [15, 20, 4] [FEET]
SWITCH
2200
2203
USER NETWORK DEVICE

FIG. 24

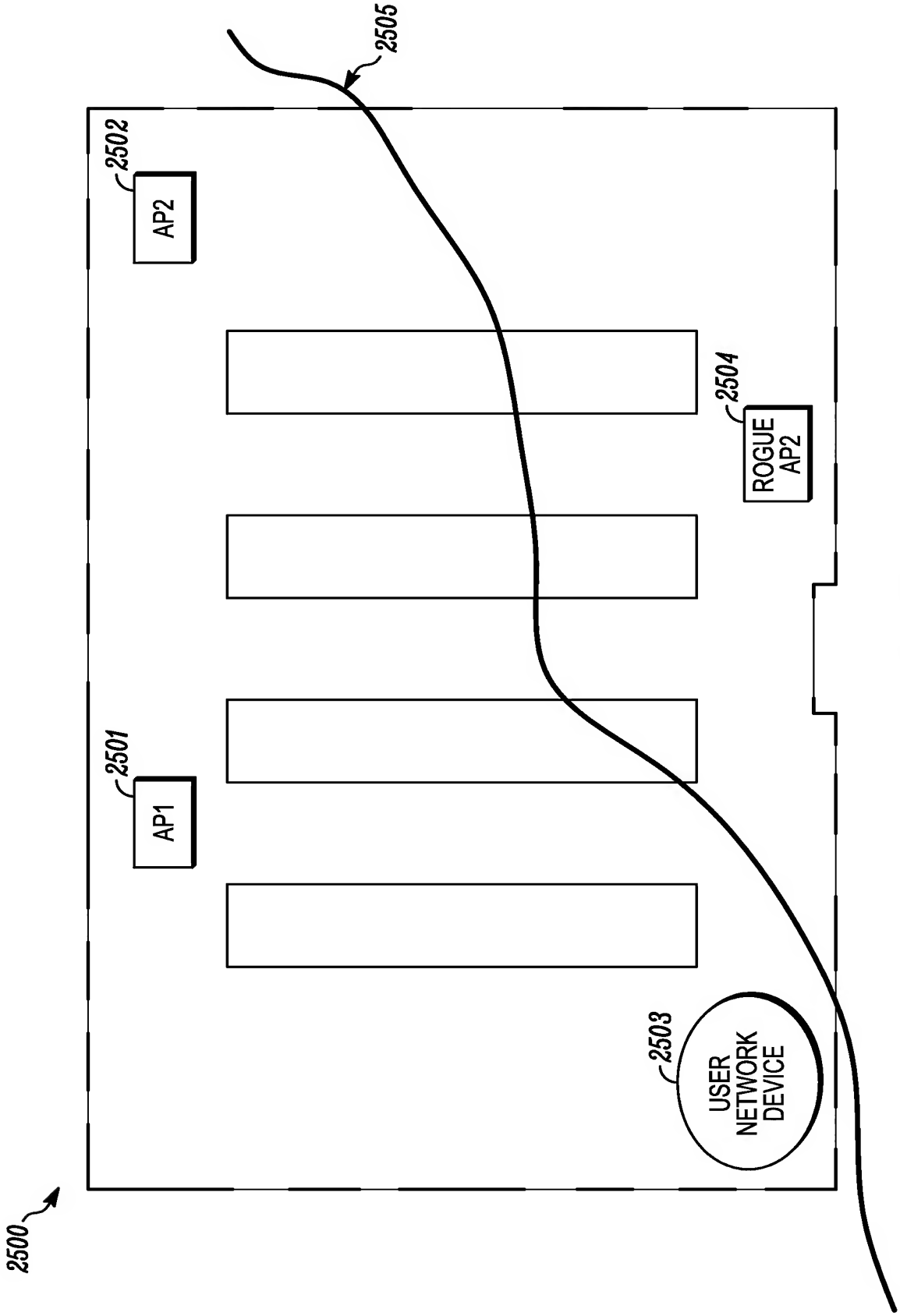
2505
2502
AP2
2504
ROGUE AP2
2501
AP1
2503
USER NETWORK DEVICE
2500

FIG. 25

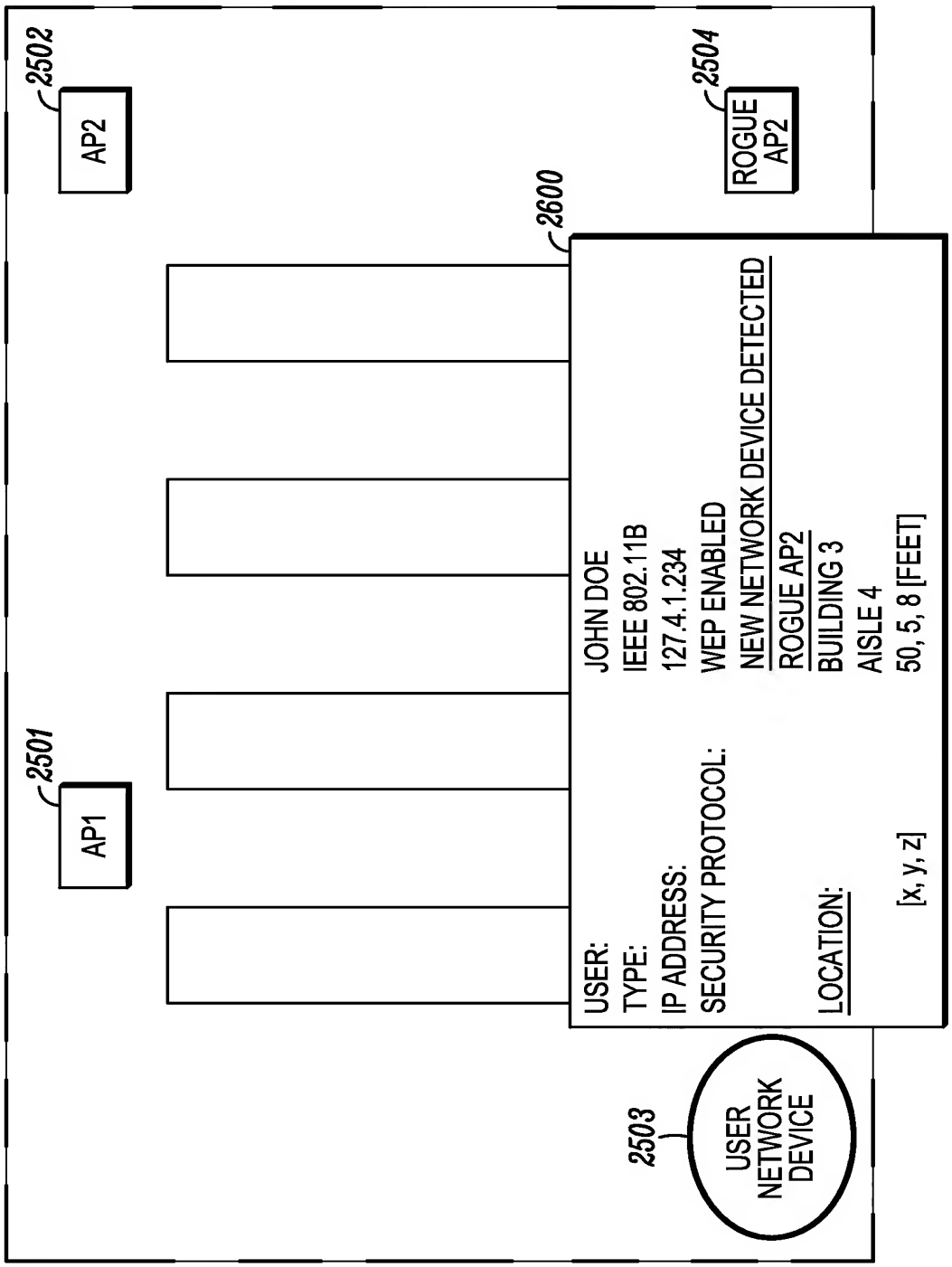
2502
AP2
2504
ROGUE AP2
2600
2501
AP1
USER:
JOHN DOE
TYPE:
IEEE 802.11B
IP ADDRESS:
127.4.1.234
SECURITY PROTOCOL:
WEP ENABLED
NEW NETWORK DEVICE DETECTED
ROGUE AP2
LOCATION:
BUILDING 3
AISLE 4
[x, y, z]
50, 5, 8 [FEET]
2503
USER NETWORK DEVICE

FIG. 26

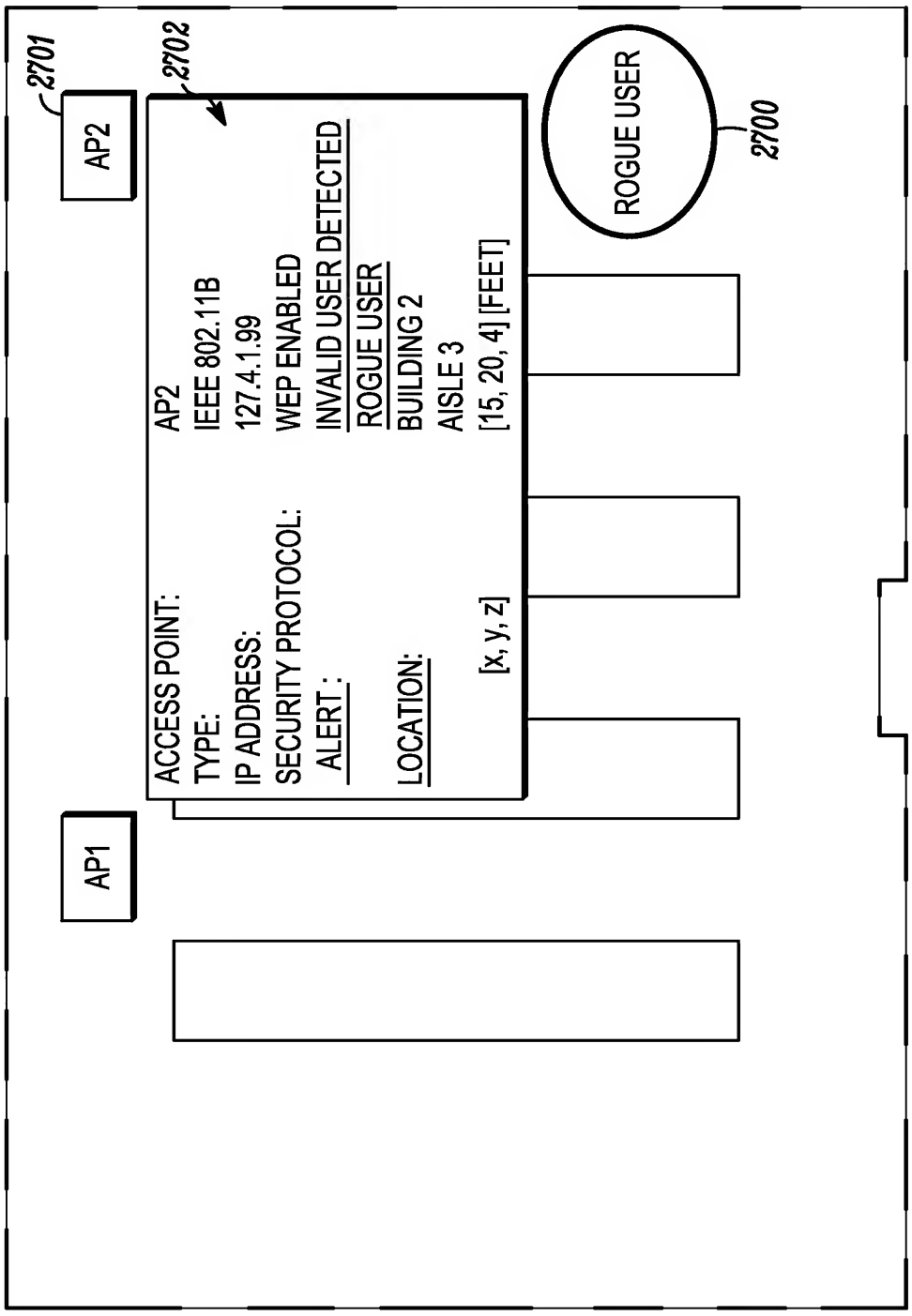
2701
2702
AP2
AP1
ROGUE USER
2700
ACCESS POINT:
TYPE:
IP ADDRESS:
SECURITY PROTOCOL:
ALERT :
LOCATION:
[x, y, z]
AP2
IEEE 802.11B
127.4.1.99
WEP ENABLED
INVALID USER DETECTED
ROGUE USER
BUILDING 2
AISLE 3
[15, 20, 4] [FEET]

FIG. 27

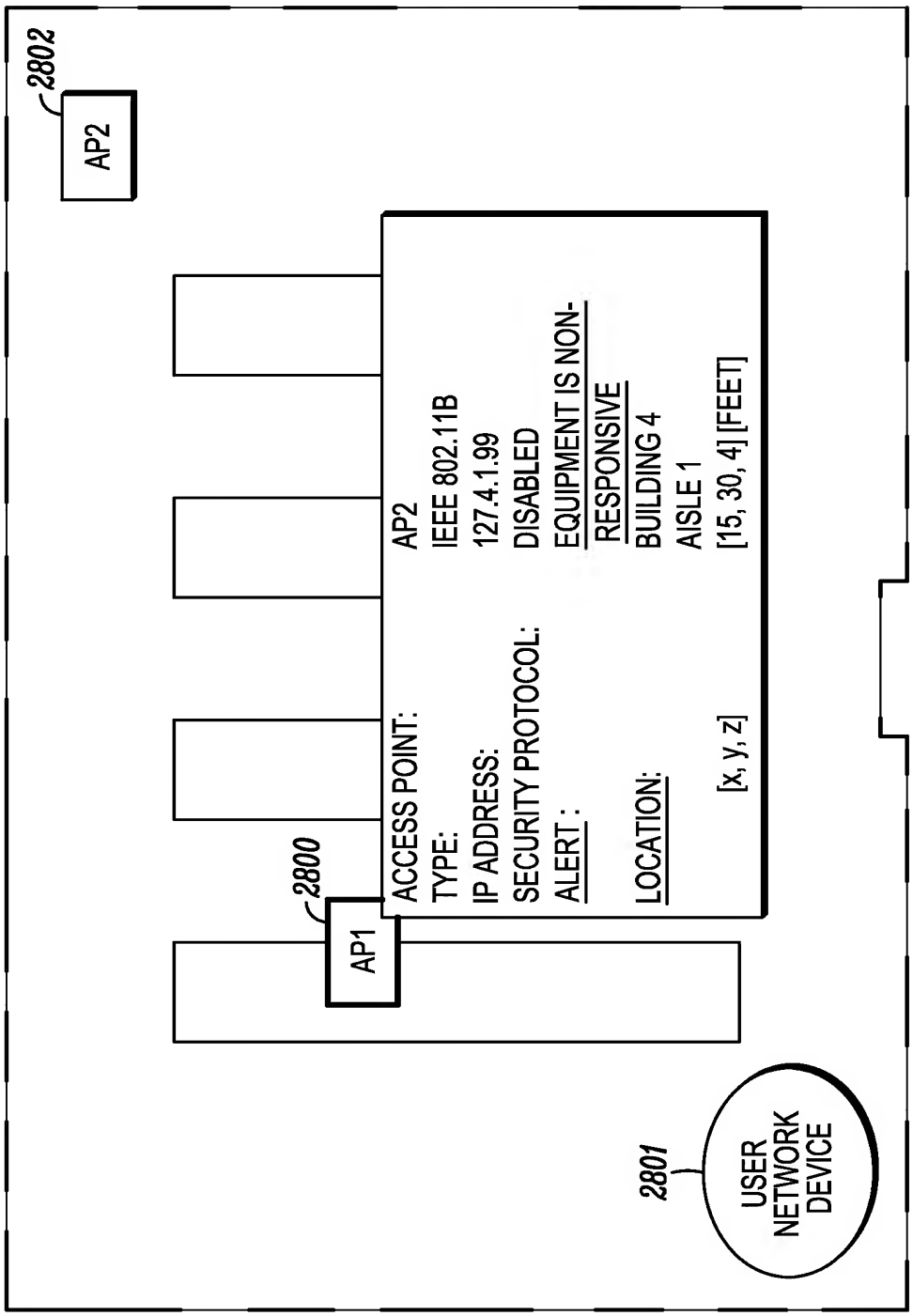
2802
AP2
2800
AP1
ACCESS POINT:
AP2
TYPE:
IEEE 802.11B
IP ADDRESS:
127.4.1.99
SECURITY PROTOCOL:
DISABLED
ALERT :
EQUIPMENT IS NON-RESPONSIVE
LOCATION:
BUILDING 4
AISLE 1
[x, y, z]
[15, 30, 4] [FEET]
2801
USER NETWORK DEVICE

FIG. 28

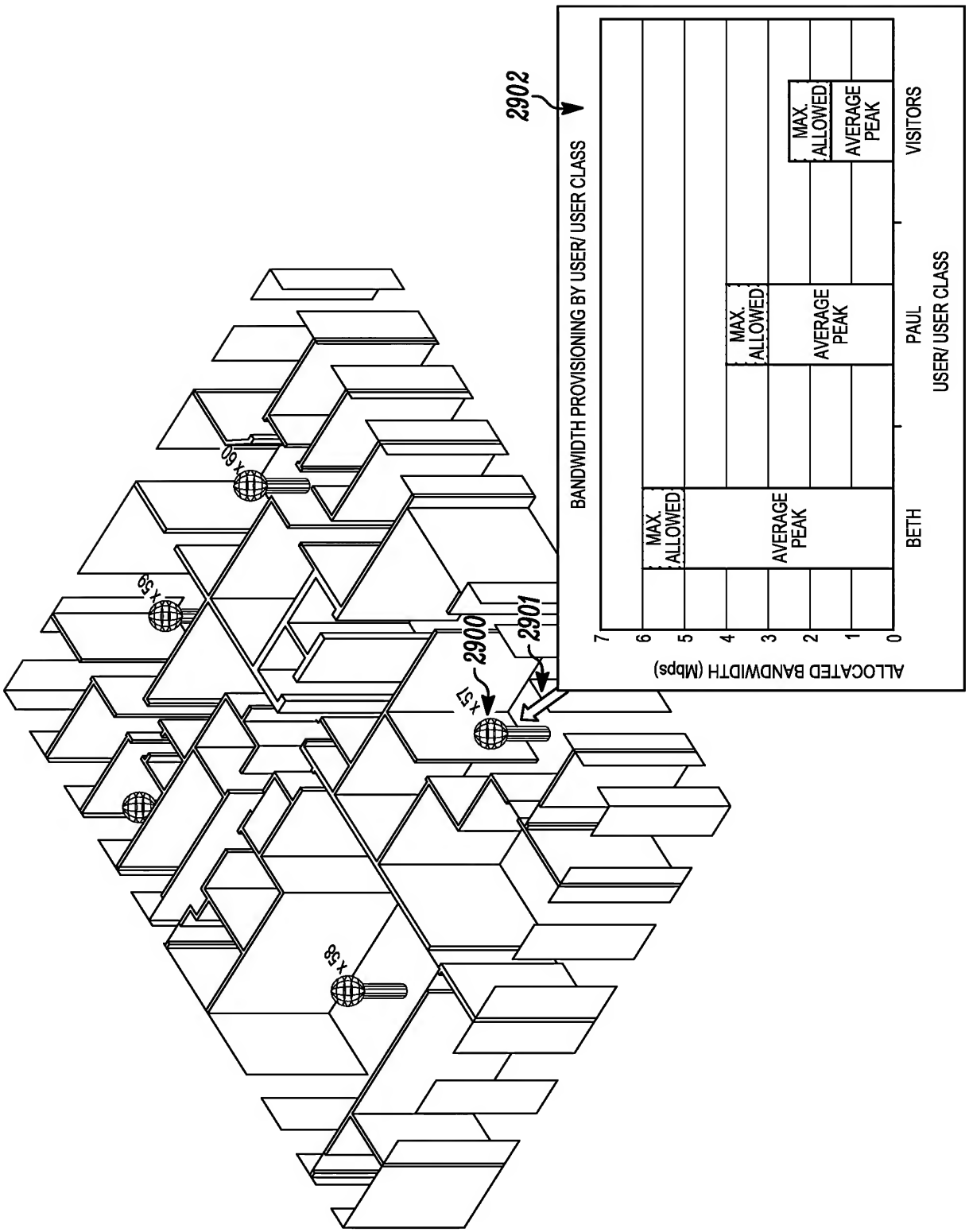
2902
BANDWIDTH PROVISIONING BY USER/ USER CLASS
ALLOCATED BANDWIDTH (Mbps)
0
1
2
3
4
5
6
7
MAX. ALLOWED
AVERAGE PEAK
BETH
MAX. ALLOWED
AVERAGE PEAK
PAUL
MAX. ALLOWED
AVERAGE PEAK
VISITORS
USER/ USER CLASS
2900
2901
x51
x38
x59
x60

FIG. 29

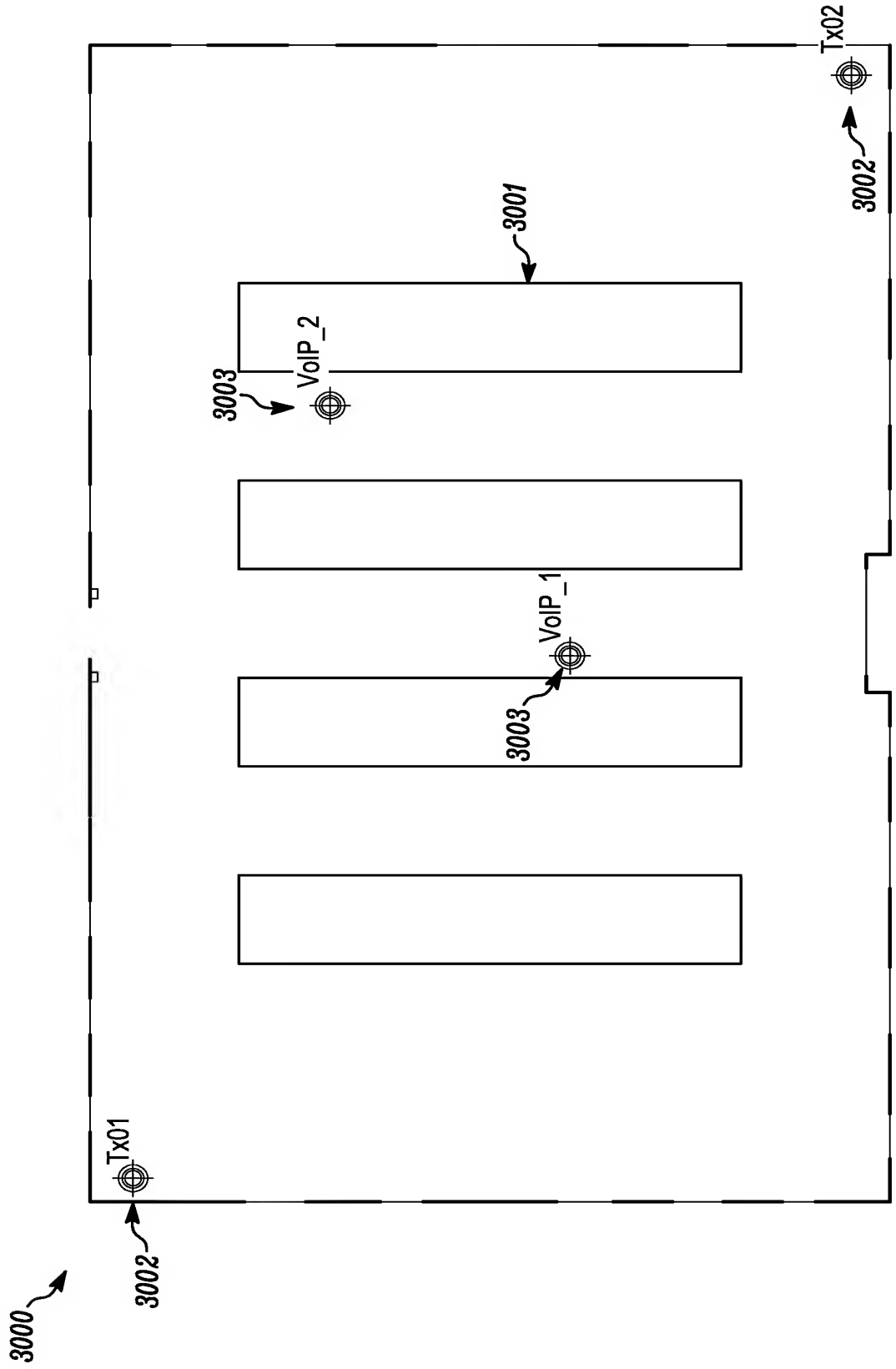

FIG. 30

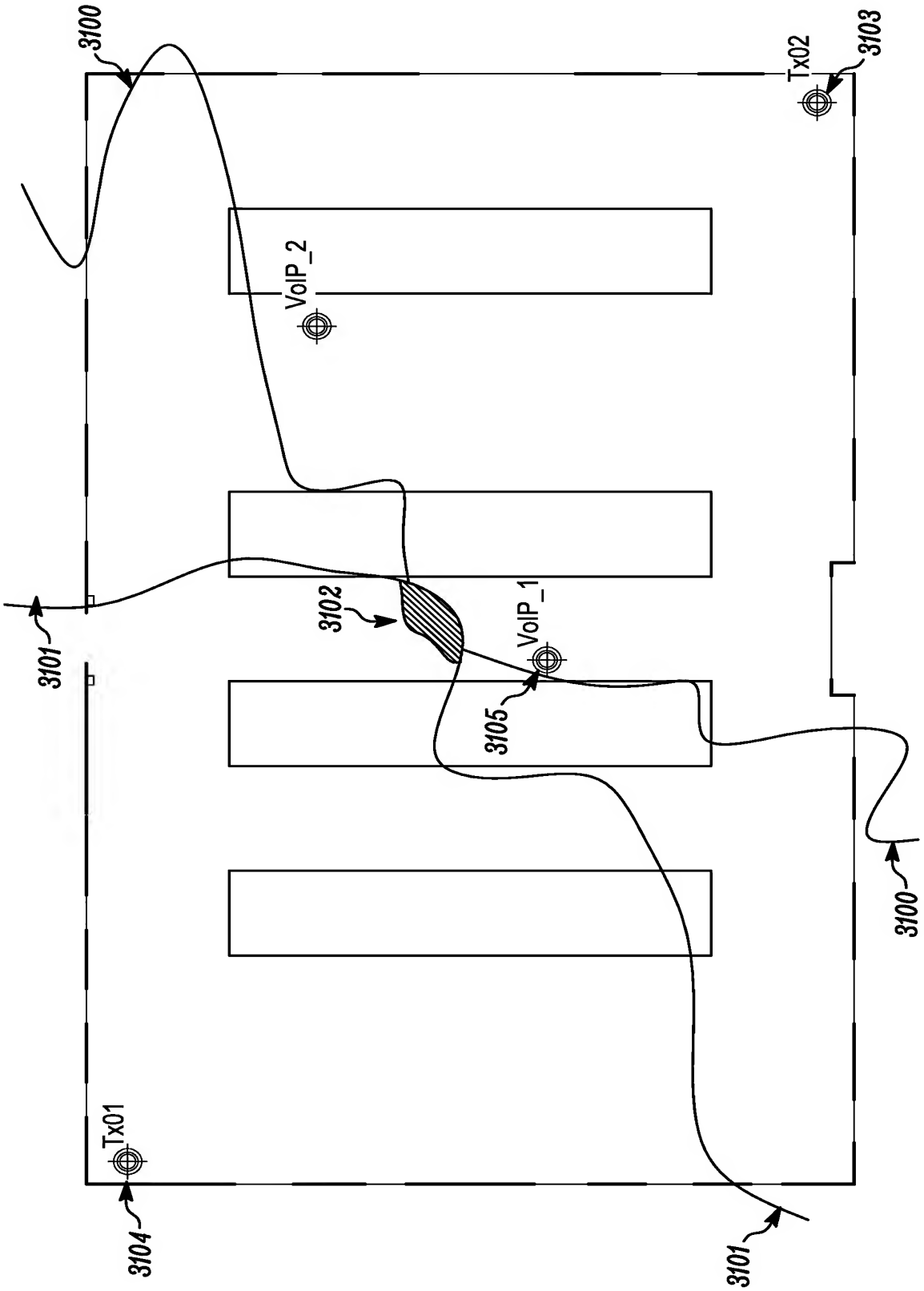
3100
Tx02
3103
VoIP_2
3102
VoIP_1
3101
3105
3100
Tx01
3104
3101

FIG. 31

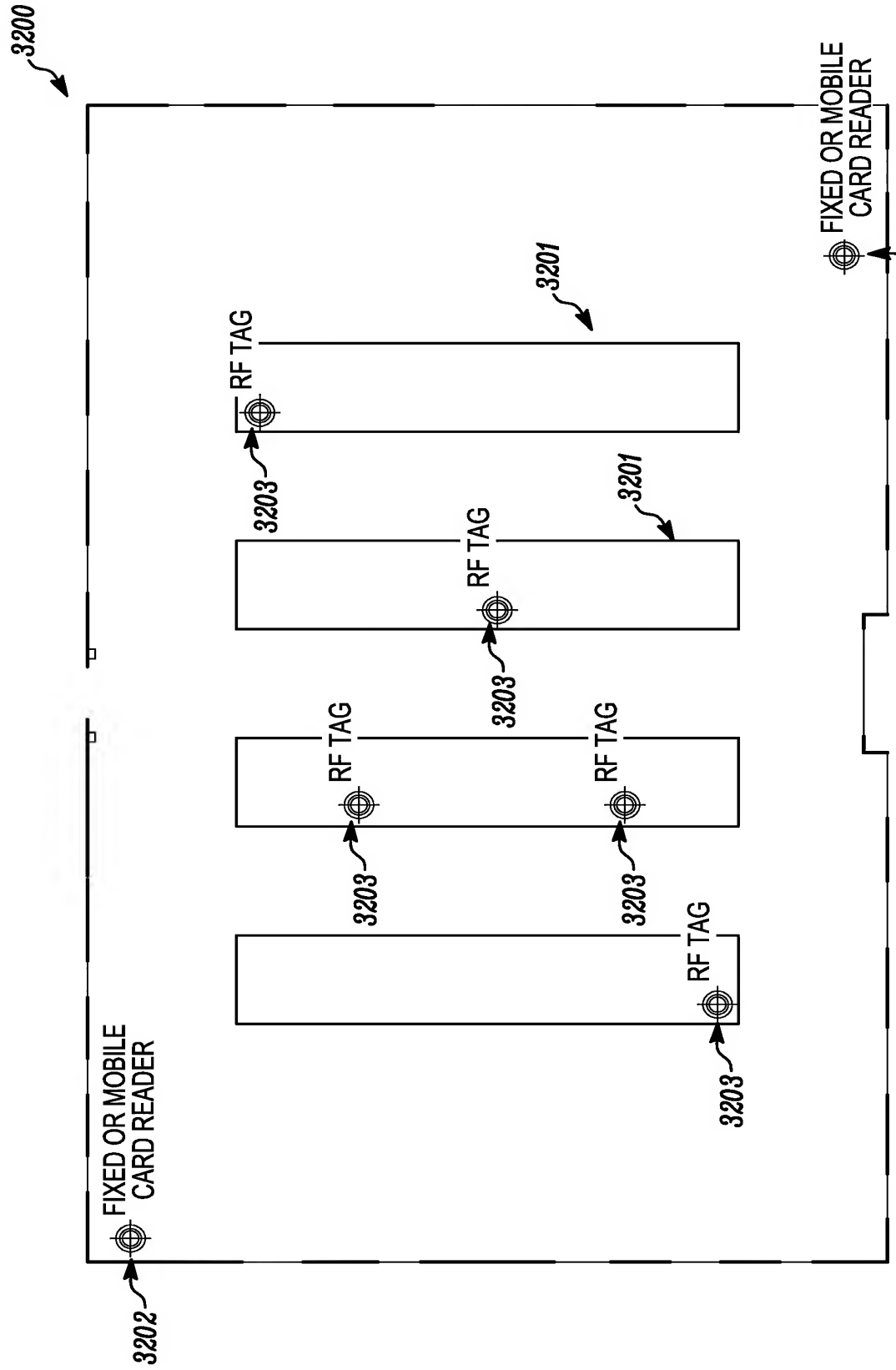
3200
FIXED OR MOBILE CARD READER
3202
3201
RF TAG
3203
3201
RF TAG
3203
RF TAG
RF TAG
3203
3203
RF TAG
3203
FIXED OR MOBILE CARD READER
3202

FIG. 32

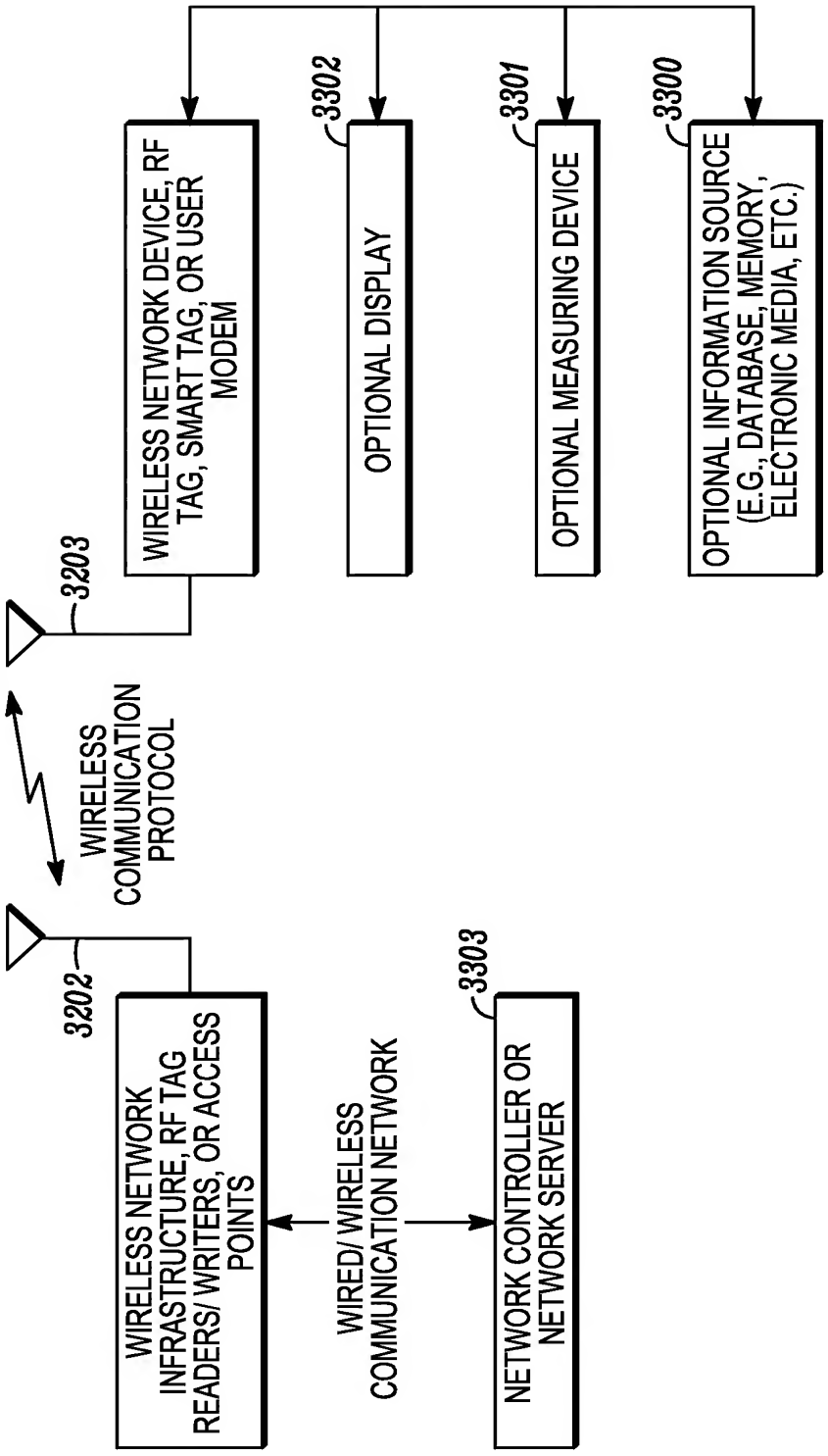
WIRELESS NETWORK DEVICE, RF TAG, SMART TAG, OR USER MODEM
OPTIONAL DISPLAY
OPTIONAL MEASURING DEVICE
OPTIONAL INFORMATION SOURCE (E.G., DATABASE, MEMORY, ELECTRONIC MEDIA, ETC.)
3203
3302
3301
3300
WIRELESS COMMUNICATION PROTOCOL
3202
WIRELESS NETWORK INFRASTRUCTURE, RF TAG READERS/ WRITERS, OR ACCESS POINTS
WIRED/ WIRELESS COMMUNICATION NETWORK
3303
NETWORK CONTROLLER OR NETWORK SERVER

FIG. 33

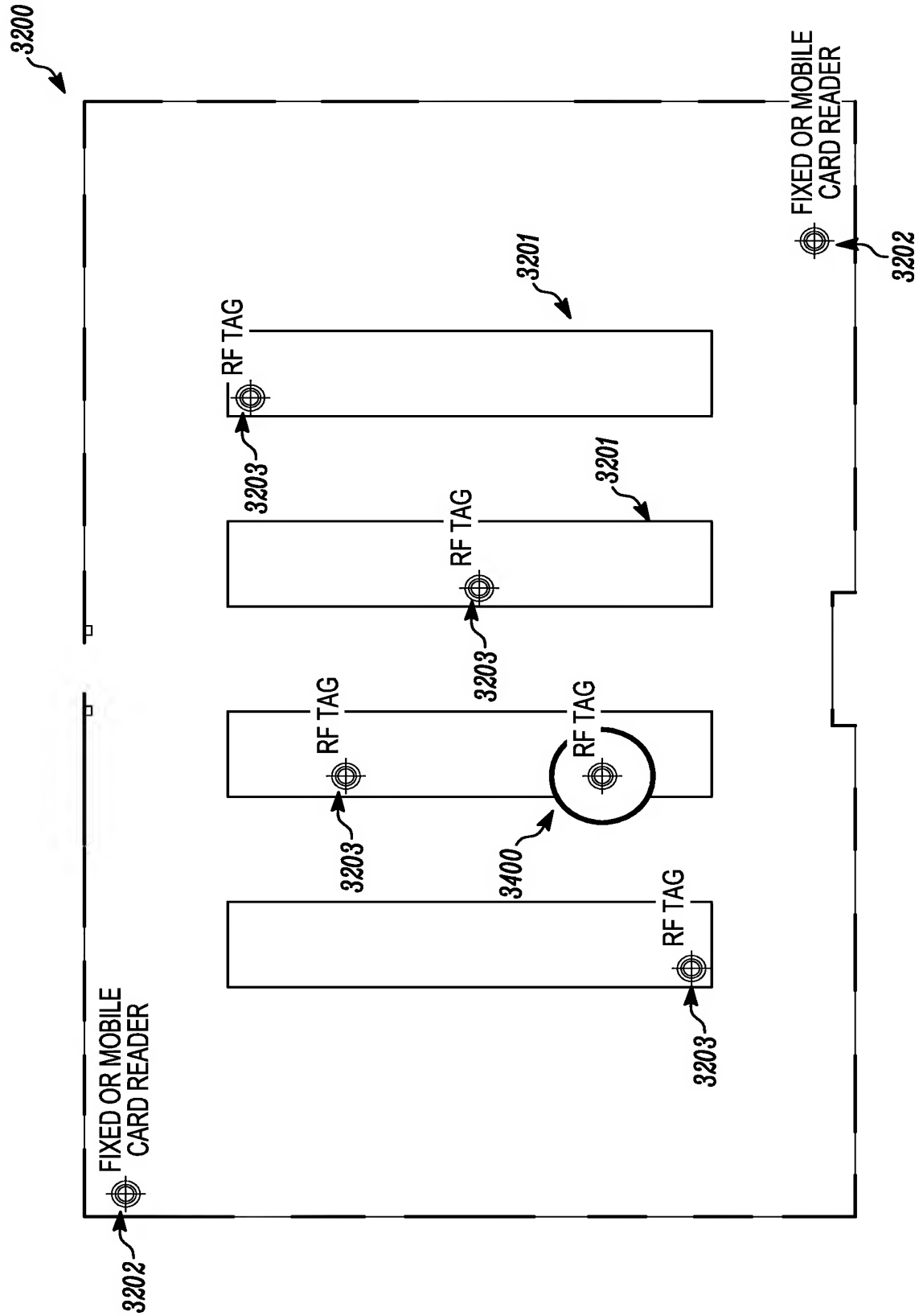
3200
FIXED OR MOBILE CARD READER
3202
3201
RF TAG
3203
3201
RF TAG
3203
RF TAG
RF TAG
3203
3400
RF TAG
3203
FIXED OR MOBILE CARD READER
3202

FIG. 34

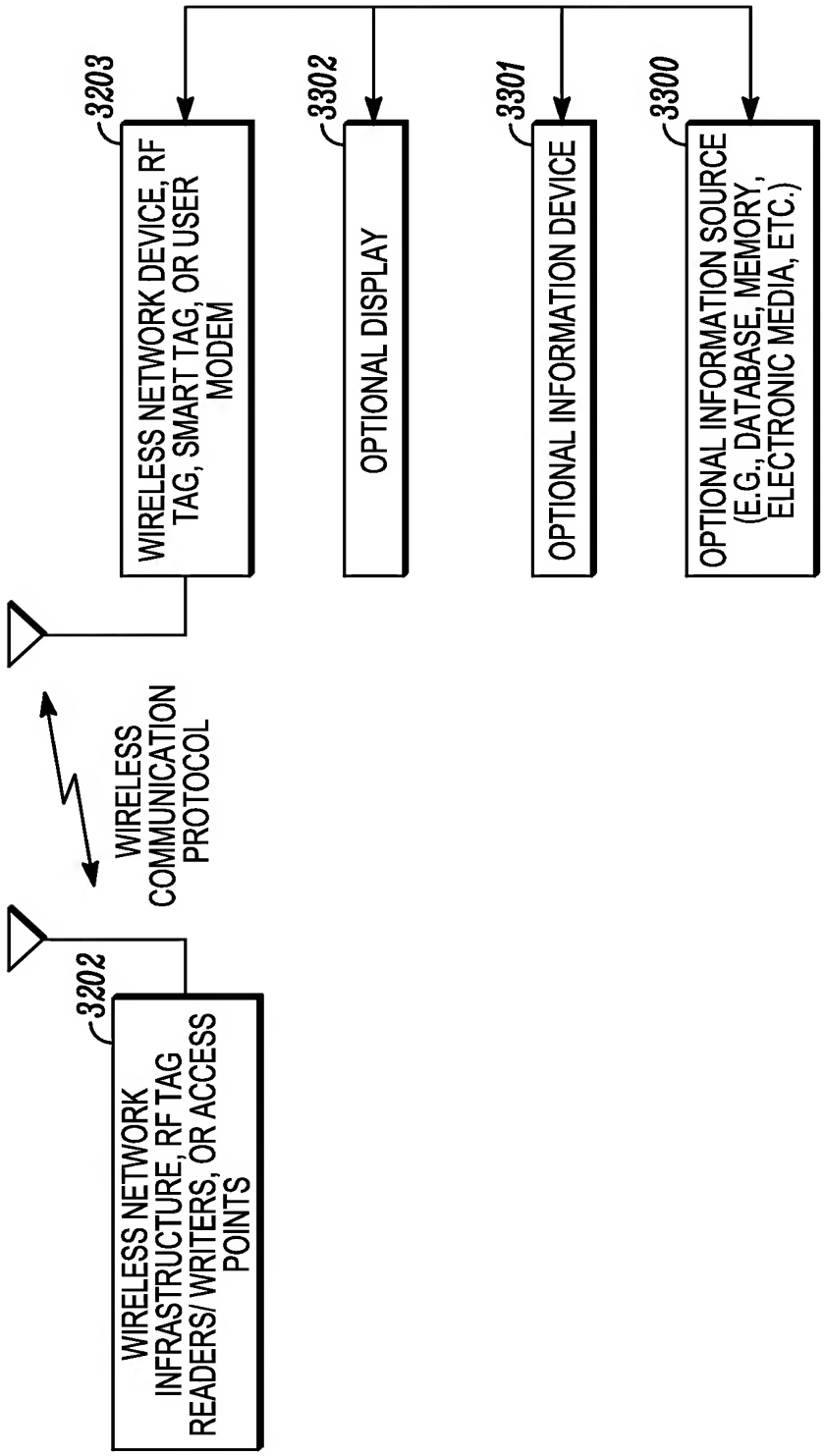
3203
WIRELESS NETWORK DEVICE, RF TAG, SMART TAG, OR USER MODEM
3302
OPTIONAL DISPLAY
3301
OPTIONAL INFORMATION DEVICE
3300
OPTIONAL INFORMATION SOURCE (E.G., DATABASE, MEMORY, ELECTRONIC MEDIA, ETC.)
WIRELESS COMMUNICATION PROTOCOL
3202
WIRELESS NETWORK INFRASTRUCTURE, RF TAG READERS/ WRITERS, OR ACCESS POINTS

FIG. 35

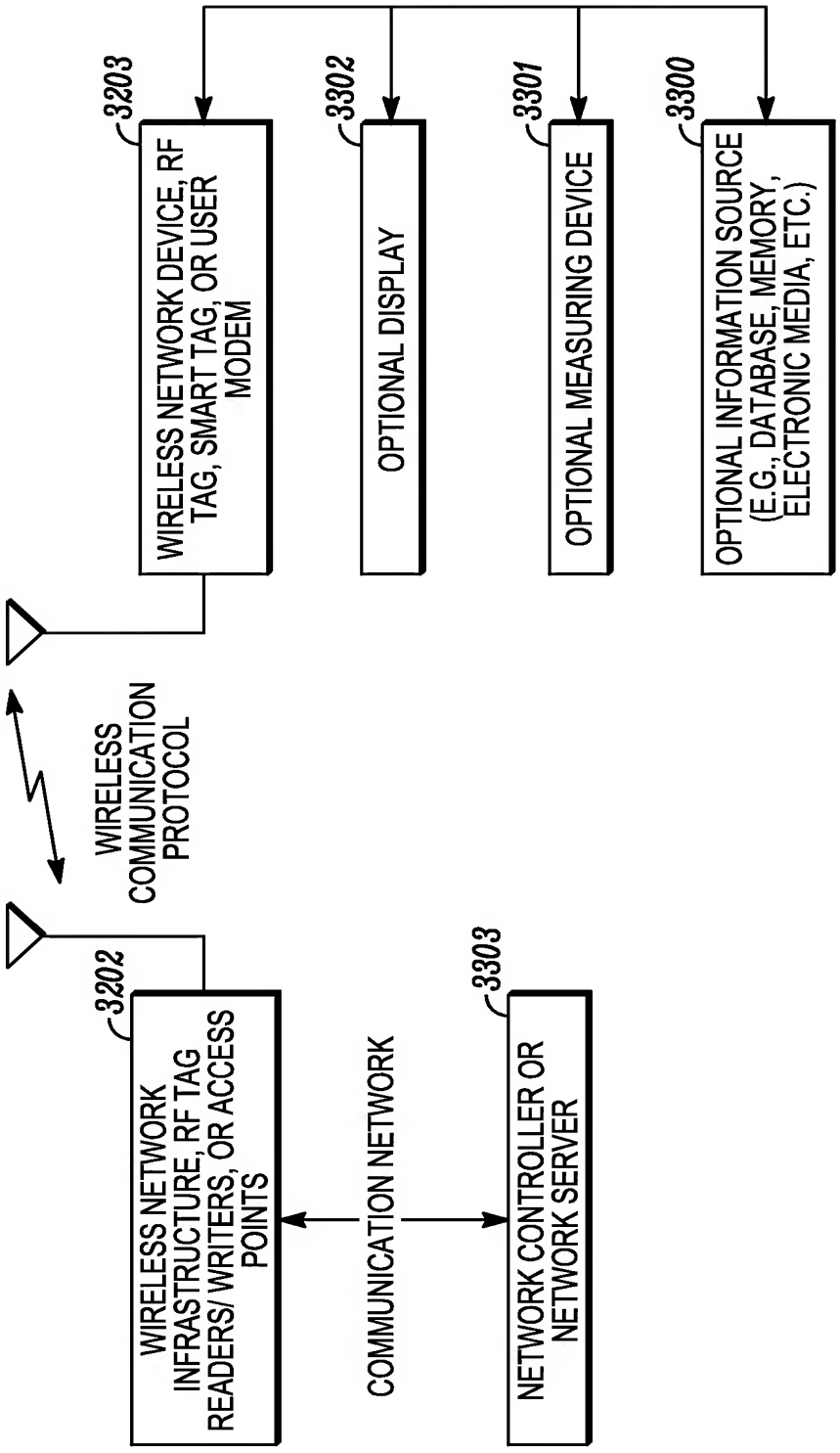
3203
WIRELESS NETWORK DEVICE, RF TAG, SMART TAG, OR USER MODEM
3302
OPTIONAL DISPLAY
3301
OPTIONAL MEASURING DEVICE
3300
OPTIONAL INFORMATION SOURCE (E.G., DATABASE, MEMORY, ELECTRONIC MEDIA, ETC.)
WIRELESS COMMUNICATION PROTOCOL
3202
WIRELESS NETWORK INFRASTRUCTURE, RF TAG READERS/ WRITERS, OR ACCESS POINTS
COMMUNICATION NETWORK
3303
NETWORK CONTROLLER OR NETWORK SERVER

FIG. 36